

U.S. Patent Application Serial No. **10/717,591**  
Amendment filed September 29, 2006  
Reply to OA dated May 30, 2006

**REMARKS**

Claims 1, 4-7, and 17 are presented for examination. Claims 2-3 were cancelled in a previous amendment. Claims 8-16 are withdrawn. New claim 17 contains identical subject matter as previously cancelled claim 3. Claim 1 has been amended in order to more particularly point out, and distinctly claim the subject matter to which the applicants regard as their invention. The amendment to claim 1 is based on p.9, lines 1-2 (aluminum pad); p. 4, lines 1-10 (etching stopper film being laminated film having layers).

The applicants respectfully submit that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated **May 30, 2006**.

The applicants thank the Examiner for the guidance provided during a telephone call on August 30, 2006.

Claims 1 and 4-7 define an electronic parts packaging structure comprising a mounted body on which electronic parts are mounted thereon, the electronic parts having a connection pad formed on a surface side of the electronic parts. In particular, the claims recite a connection pad constructed of (1) an *aluminum pad* made of an aluminum or an aluminum alloy, and (2) an etching stopper film *covering* the aluminum pad. Furthermore, the etching stopper film is a laminated film having *layers*

U.S. Patent Application Serial No. **10/717,591**  
Amendment filed September 29, 2006  
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of film, wherein the *uppermost film* of the etching stopper film is a member selected from a group consisting of a *copper film, a gold film, a silver film, and a conductive paste film*.

**Claims 1, 3-5, and 7 have been rejected under 35 USC 103(a) as being obvious over Akagawa (PGPAB #2001/0010627 hereinafter "Akagawa") in view of Osawa, et al. (PGPAB #2001/0011767) in view of Akagawa (Patent #5960308 hereinafter "Akagawa 1").**

The Office Action asserts that **Akagawa** discloses an electronic parts structure comprising a mounted body on which electronic parts are mounted, the electronic parts (40) having a connection pad (page 3, [0045]). The Office Action concedes that **Akagawa** does not teach a connection pad constructed of a laminated film having an etching stopper film as an uppermost layer, or that the laminating film consists of layers, the layers of film being: copper, gold, silver, or conductive paste/nickel, chromium, or titanium/aluminum. The Office Action cites **Osawa** for the disclosure of a connection pad constructed of laminated film having layers of film, the laminated film having an etching stopper film as an uppermost film, and points to Fig. 9A; p.4, [0063], [0065], and [0071] as support. Additionally, the Office Action cites **Akagawa 1** for the disclosure that the etching stopper film is a member selected from a group consisting of a copper film, and asserts that, at the time the invention was made, it was well known to use etching stopper film selected from a group consisting of a copper film, a gold film, a silver film, and a conductive paste film.

As amended, however, the combined disclosure of the cited references fail to teach the invention recited in amended claim 1. Amended claim 1 of the present invention defines a

connection pad constructed of (1) an *aluminum pad*, and (2) an etching stopper film *covering* the aluminum pad. Furthermore, amended claim 1 recites, rather than the connection pad, that the *etching stopper film* is constructed of a *laminated film having layers of film*, with the uppermost film being a member selected from a group consisting of a copper film, a gold film, a silver film, and a conductive paste film. In other words, in the claimed invention, the connection pad comprises an aluminum pad *covered* by an etching stopper film, and the *etching stopper film* is formed of not a single layer of film, but a *laminated film having layers of film*. Furthermore, of the layers of film that form the laminated etching stopper film, not the *entire* etching stopper film, but only the *uppermost layer* is defined as being a member selected from a group consisting of a copper film, a gold film, a silver film, and a conductive paste film.

However, contrary to amended claim 1, the cited references in combination fail to disclose a *connection pad* constructed of an aluminum pad covered by a laminated etching stopper film having layers of film. **Akagawa** does not teach a connection pad constructed of a laminated film having an etching stopper film as an uppermost layer, as the Office Action concedes, or an aluminum pad. Similarly, **Akagawa 1** fails to disclose a laminated film having an etching stopper film as an uppermost layer, or an aluminum pad covered by an etching stopper film (in **Akagawa 1**, nothing is formed on the aluminum pad (36)). In **Osawa**, no *connection pad* is disclosed as being constructed of an *aluminum pad* and an *etching stopper film* formed of a laminated film having multiple layers of film, wherein such etching stopper film *covers* the aluminum pad. In fact, in **Osawa**, the connection pad (3) mounted on the semiconductor chip (2) does not contain laminated

film. (Osawa, Fig. 10E). **Osawa** teaches that the aluminum film functions as an etching stopper film, *not as part of a connection pad*, and is located *between* layers of nickel and copper films. In fact, paragraph [0012] of **Osawa** teaches that the laminated film containing the aluminum film is “sequentially removed by selective etching,” until no aluminum film or any other film remains as part of the connection pad. (Osawa, p.1, [0012]) (although an outer ring is left, the outer ring is not connected to the connection pad). Fig. 9 of **Osawa** shows a semiconductor package undergoing construction. During the manufacture of the semiconductor package, a *metal base* (20) is obtained by forming a multi-layer of a nickel film layer on an aluminum layer on a copper layer. However, in the completed semiconductor package disclosed in Figs. 7 and 10E, the electrode pads (3) on the *electronic parts are not constructed of laminated film* having layers of film because the laminated film having layers has been etched away. No disclosure is made regarding an *electronic parts* having a *connection pad* constructed of (1) an aluminum pad and (2) an etching stopper film covering the aluminum pad. Additionally, no disclosure is made regarding etching stopper film that is *a part of a connection pad*, the etching stopper film being constructed of laminated film having several layers of film.

Moreover, the combined disclosure of the cited references fail to teach an etching stopper film that is a part of a connection pad, and being formed by a *laminated film having layers of film*. As mentioned above, **Akagawa** fails to teach a connection pad constructed of a laminated film having etching stopper film. Similarly, **Akagawa 1** fails to disclose a laminated film having an etching stopper film as an uppermost layer. In **Osawa**, as discussed above, the disclosed metal base

U.S. Patent Application Serial No. **10/717,591**  
Amendment filed September 29, 2006  
Reply to OA dated May 30, 2006

formed of layers of nickel, aluminum, and copper, is selectively etched away until *no* layer remains as a part of a connection pad, let alone a laminated layer having multiple layers of film (the portion of the metal base which remains intact as the outer ring is not a part of a connection pad, and not connected to the connection pad by any external connection terminal, and also does not act as an etching stopper film since the outer ring is never intended to be etched).

In addition, the combined disclosures of the cited references fail to teach that the *uppermost* layer of the etching stopper film is a member selected from a group consisting of a copper film, *a gold film, a silver film, and a conductive paste film*. As discussed above, the cited references in combination fail to teach an etching stopper film that is *a part of a connection pad*, the etching stopper film being formed of a *laminated film* having *layers* of film. Accordingly, the references in combination fail to teach an etching stopper film even having an *uppermost* film, let alone that the uppermost film is selected from a group consisting of a copper film, *a gold film, a silver film, and a conductive paste film*.

In regards to a copper film, a gold film, a silver film, or a conductive paste film being used as an etching stopper layer, **Akagawa 1** appears to be cited for this disclosure. However, contrary to the Office Action's assertions, **Akagawa 1** teaches an etching stopper film being a chromium film, a copper film, or a multi-metal layer of Cr--Ni--Cu. The reference does not teach a gold film, a silver film, or a conductive paste film.

Furthermore, no motivation exists to combine **Akagawa 1** and **Akagawa** and **Osawa** since the asserted etching stopper member disclosed in **Akagawa 1**, actually, an ultraviolet beam shielding

U.S. Patent Application Serial No. **10/717,591**  
Amendment filed September 29, 2006  
Reply to OA dated May 30, 2006

member, is not directed toward the etching stopper film art as the present invention. In **Akagawa 1**, even if the ultraviolet beam shielding layer (50) is made of copper, a disclosed layer, the copper film merely functions to shield exposure of photolithography in order to prevent damage to *circuit patterns* of the semiconductor chip, which is a wholly different function than the function of an etching stopper film as in amended claim 1 which stops a laser from *etching* the etching stopper film. Accordingly, no person skilled in the art of the claimed invention would apply the ultraviolet beam shielding layer (50) in **Akagawa 1** to the connection pad of the semiconductor chip (40) in **Akagawa**.

**Akagawa, Osawa, and Akagawa 1** fail to render the present invention recited in claims 1 and 4-7 obvious because the combined disclosure of the references do not teach an electronic parts packaging structure comprising a connection pad constructed of (1) an *aluminum pad* made of an aluminum or an aluminum alloy, and (2) an etching stopper film *covering* the aluminum pad; the etching stopper film being a *laminated film having layers* of film, wherein the *uppermost film* of the etching stopper film is a member selected from a group consisting of a copper film, *a gold film, a silver film, and a conductive paste film*. Furthermore, no motivation exists to combine **Akagawa 1** and **Akagawa and Osawa** since the ultraviolet beam shielding member disclosed in **Akagawa 1** is not directed toward the etching stopper film art as in the present invention.

It is respectfully requested that this rejection be reconsidered and withdrawn.

U.S. Patent Application Serial No. **10/717,591**  
Amendment filed September 29, 2006  
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**Claim 6 is rejected under 35 U.S.C. 103(a) as being obvious over Akagawa in view of Osawa and in view of Akagawa 1 and in view of Ho et al. (U.S. Patent Application Publication 2003/0218249).**

For the reasons described above, it is respectfully requested that this rejection be reconsidered and withdrawn.

In view of the aforementioned amendments and accompanying remarks, claims 1, 4-7, and 17, as amended, are in condition for allowance, which action, at an early date, is requested.

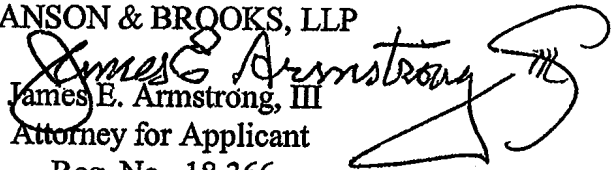
If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

U.S. Patent Application Serial No. 10/717,591  
Amendment filed September 29, 2006  
Reply to OA dated May 30, 2006

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosures: Request for Continued Examination

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